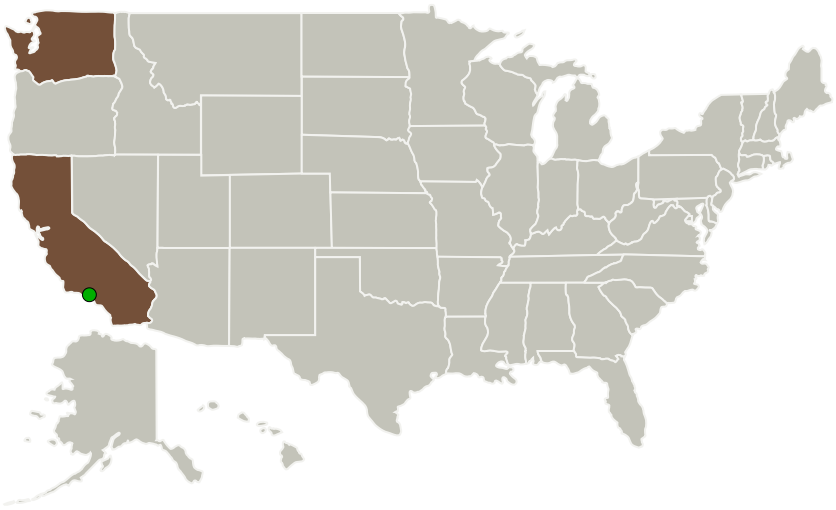
VORTEX Gimbal, Phase I

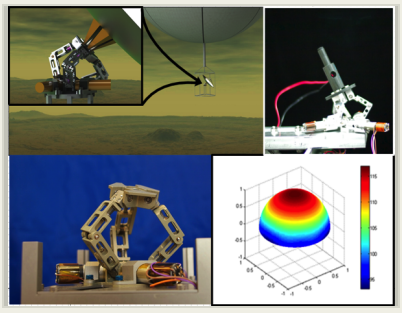
Completed Technology Project (2015 - 2015)

Project Introduction

To overcome the communication gap to Venus, TUI proposes to develop the Venus or Titan Exploratory (VORTEX) Gimbal to point a meter scale diameter, high gain antenna. The VORTEX Gimbal is a highly advanced adaptation of the COBRA gimbal developed by TUI for the nanosatellite market. The VORTEX Gimbal will be capable of providing performance characteristics that are unmatched in the current high-fidelity gimbal market at a SWAP (size, weight and power) that has yet to be developed. Included in these characteristics is the ability to slew and rotate continuously in any direction from any position without the need for failure-prone and costly slip rings. This feature will be highly beneficial for coaxial or other cabling that is needed to pass from the payload to the antenna via the gimbal. Due to the lack of slip rings, this mechanism will be significantly more reliable than traditional gimbal mechanisms. The VORTEX Gimbal also provides 3 degrees of freedom (DOF) by nature of its design. This means that in addition to hemispherical-plus pointing (greater than 2 pi steradians), the VORTEX Gimbal has the ability to stow compactly for launch in a much denser volume than its operational workspace.

Primary U.S. Work Locations and Key Partners





VORTEX Gimbal, Phase I

Table of Contents

Small Business Innovation Research/Small Business Tech Transfer

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Organizations Performing Work	Role	Type	Location
Tethers Unlimited Inc	Lead Organization	Industry	
Jet Propulsion Laboratory(JPL)	Supporting Organization	NASA Center	Pasadena, California

Primary U.S. Work Locations	
California	Washington

Project Transitions

June 2015: Project Start

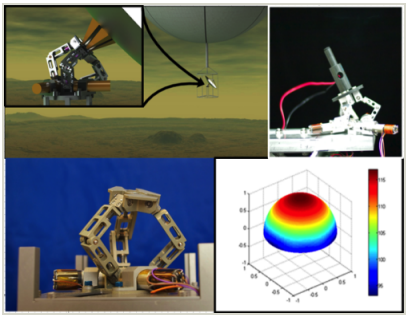
December 2015: Closed out

Closeout Summary: VORTEX Gimbal, Phase I Project Image

Closeout Documentation:

- Final Summary Chart Image*(https://techport.nasa.gov/file/139550)*

Images



Briefing Chart Image
VORTEX Gimbal, Phase I
(https://techport.nasa.gov/image/126166)

Organizational Responsibility

Responsible Mission Directorate:
Space Technology Mission Directorate (STMD)

Lead Organization:
Tethers Unlimited Inc

Responsible Program:
Small Business Innovation Research/Small Business Tech Transfer

Project Management

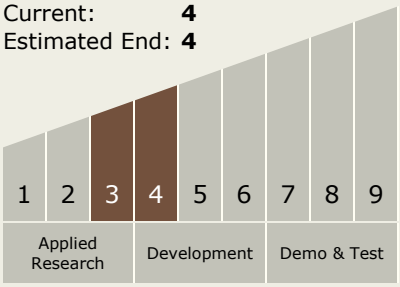
Program Director:
Jason L Kessler

Program Manager:
Carlos Torrez

Principal Investigator:
Jeffrey T Slostad

Technology Maturity (TRL)

Start: **3**
Current: **4**
Estimated End: **4**



VORTEX Gimbal, Phase I

Completed Technology Project (2015 - 2015)

Technology Areas

Primary:

- TX04 Robotic Systems
  - TX04.2 Mobility
    - TX04.2.4 Surface Mobility

Target Destinations

The Sun, Earth, The Moon, Mars, Others Inside the Solar System, Outside the Solar System